Science Fridge/Freezer

Completed Technology Project (2012 - 2012)

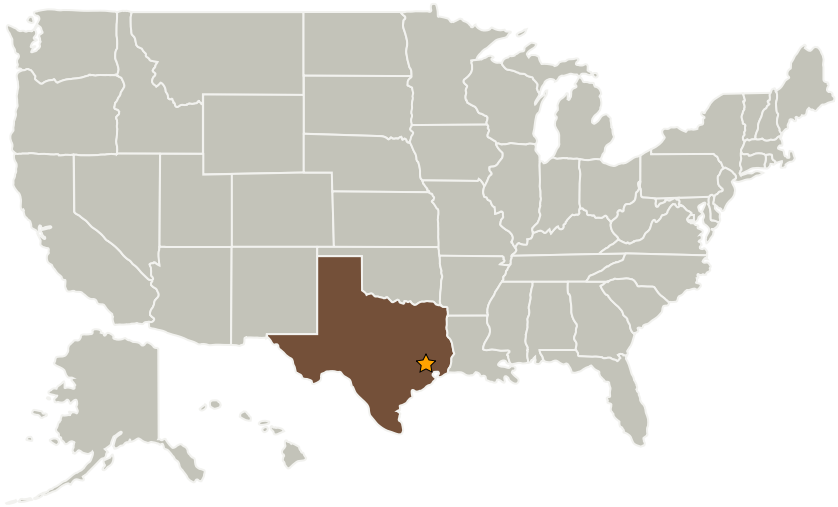
Project Introduction

Future missions will need compact, efficient refrigeration systems for science as well as other uses. NASA should take advantage of the latest state-of-the-art technology on Earth and leverage that for use in space. Space Shuttle had vapor compression refrigerator-freezers, but they required servicing after every mission due to their design to avoid micro-gravity issues. Space Station has thermoelectric refrigerator-freezers which avoid micro-gravity issues, but are not energy efficient. There is no currently acceptable vapor compression refrigerator-freezer (the mainstay of refrigeration on Earth) for use in space. Utilizing a very small, oil-free compressor that has just come onto the market, we will build a proof-of-concept micro-gravity compatible vapor compression refrigerator-freezer that can be used to store medical and other science samples at temperatures from +5C to -20C. Space Station thermoelectric refrigerator-freezers have had some in-flight issues. Thus, this proposal addresses the challenge of Space Health and Medicine.

Anticipated Benefits

There is no currently acceptable vapor compression refrigerator-freezer (the mainstay of refrigeration on Earth) for use in space. Utilizing a very small, oil-free compressor that has just come onto the market, we will build a proof-of-concept micro-gravity compatible vapor compression refrigerator-freezer that can be used to store medical and other science samples at temperatures from +5C to -20C.

Primary U.S. Work Locations and Key Partners



Project Image Science Fridge/Freezer

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Center Innovation Fund: JSC CIF

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations
Texas

Images

10756-1377017737055.jpg
Project Image Science Fridge/Freezer
(https://techport.nasa.gov/image/2239)

Project Management

Program Director:
Michael R Lapointe

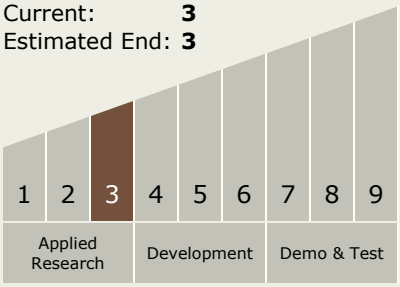
Program Manager:
Carlos H Westhelle

Project Manager:
Michael K Ewert

Principal Investigator:
Michael K Ewert

Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.3 Manipulation
    - TX04.3.2 Grappling Technologies